Attorney Docket No. 06666-076001
Application No. 09/848,773
Amendment dated March 24, 2004
Reply to Office Action dated November 26, 2003

<u>REMARKS</u>

Reconsideration and allowance of the above-referenced application are respectfully requested.

Claims 1-24, 29-39 and 43-63 are pending.

These claims are rejected based on Zhang ('923) in view of Zhang ('406), or in view of VanEssen and Szeliski.

Upon reviewing these documents, it can be seen that Zhang ('406) has an effective filing date of May 4, 2000. This filing date is one day <u>after</u> the filing date of the U.S. Provisional Application No. 60/201,585, upon which this application claims priority. Accordingly, it is respectfully suggested that Zhang ('406) is not properly prior art in this case, since its filing date is <u>after</u> the effective filing date of the present application.

In order to demonstrate the right to priority based on provisional 60/201,585 filed May 3, 2000, the undersigned will herewith demonstrate how each of the independent claims finds full support in that prior provisional application.

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Claim 1

1. A method, comprising: obtaining two images of similar image information from two uncalibrated sources;	The provisional at page 2, right column, left paragraph describes that the input to the system is a pair of images, and section 2 on page 3 of the provisional describes that the two cameras used to generate the stereo images are not in general parallel. This is further emphasized by page 3, right column, just above figure 3 which states that "performing full camera calibration is thus avoided". Therefore, two images of the similar information are obtained from two uncalibrated sources.
superimposing lines formed on said images to rectify the two images relative to one another to form rectified images; and	The rectification described in section 2 describes aligning the image planes (see, generally, page 3, left column last two full paragraphs). The right column of page 3 further describes this rectification which is done by superimposing lines, see the first sentence under figure 2 on page 3.
using said rectified images to form three-dimensional information by forming a disparity map of three dimensional information for specified coordinates of matching pixels.	The rectified images are then used to form a disparity map; see page 4, left column at the end of the first full paragraph (which is described as recording the disparity value for each pixel (UV)). Section 3.1 describes that the disparity map along with the value d for each pixel forms a u-v-d volume. Therefore, the map of d, u and v is three-dimensional information for

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	specified coordinates of matching pixels.

Therefore, claim 1 is clearly entitled to the filing date of

U.S. Provisional Application No. 60/281,585, and, therefore,

Zhang ('406) is not effective as prior art against claim 1 (or

the claims that depend therefrom).

Claim 29

obtaining first and second images of the same object;	Page 2, right column, last paragraph describes a pair of images of the same object.
identifying objects in said first and second images, and forming lines which intersect said objects;	Figure 3 shows the image rectification and shows objects in the first and second images, and also shows lines that intersect the objects.
aligning said lines in an epipolar geometry representation;	Figure 2, as well as the paragraph above and below figure 2 explain that the lines are based in epipolar geometry.
using said first and second images, with said aligned lines, to form three-dimensional information; and	Page 4, left column describe forming the u.v., the volume, which is three-dimensional information.
identifying at least one seed voxel, with a relatively high probability of being a correct three-dimensional measure.	Section 3.2.1, step 1, on page 4 describes forming at least one seed voxel. The value indicates the confidence in the seed points, and may be set close to one; or, as stated in the claim 11, "a relatively

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	high probability of being a correct the three-dimensional measure".

For these reasons, therefore, claim 29 is clearly entitled to priority based on U.S. Provisional Application No. 60/281,585, filed May 3, 2000, and hence Zhang ('406) is not effective as prior art against this claim, or the claims which depend therefrom.

Claim 39

Initially note that the first 5 subsections of this claim are precisely the same as those listed above for claim 29.)

wherein said three-dimensional information includes a disparity map, and further comprising converting said disparity map into three-dimensional Euclidean points.	The disparity map is described at column 4, first full paragraph. It is also described on the first page of the description, along with the description that the reconstruction algorithm converts the disparity information into three-dimensional u-v-d. This is also described on page 5, for example, and summarized in the first line under "shape inference".

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Therefore, claim 39 is also entitled to priority based on U.S.

Provisional Application No. 60/281,585, filed May 3, 2000, and

hence Zhang ('406) is not effective as prior art against this

claim, or the claims which depend therefrom.

Claim 43

A method, comprising: obtaining information about an image from two uncalibrated cameras;	The cameras are described in multiple places including in the first sentence under section 21 page 3. Just above figure 3 on page 3, describes that the camera calibration is avoided. Therefore, the information is obtained from two uncalibrated cameras.
using said information from said two uncalibrated cameras to obtain three-dimensional information;	This information is described as being converted into a disparity map of three-dimensional information, shown as the u.v.d. volume in section 3.1 on page 4.
wherein said using comprises rectifying said images to form coplanar images with scan lines that are horizontally parallel; and	Part of forming it in this way is the rectification which is carried out, and described in section 2, image rectification, on page 3. The rectification produces scan lines that are parallel, as evident from figures 2 and 3, and as also described in the text underneath figure 2 on page 3.
wherein said rectifying comprises identifying points in	The rectification is carried out, as shown in figure 3, by

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each of the images, and identifying scan lines with pass through said points.	identifying points in the image, and using the scan lines shown in figure 3 which pass through those points.

Therefore, claim 43 is also entitled to priority based on U.S. Provisional Application No. 60/281,585, filed May 3, 2000, and hence Zhang ('406) is not effective as prior art against this claim, or the claims which depend therefrom.

Claim 44

(Initially, note that the first three sections of this discussion are the same as those above with respect to claim 43).

further comprising finding an average of said scan lines between one end of a first image and another end of a second image, and reforming said scan lines between said one end and another end to form said horizontally parallel scan lines.	Page 3, right column, first full paragraph describes that the reformed scan lines shown as v1, for example, is the average of the coordinates between one end of a first image and another end of the second image.

Therefore, claim 44 is also entitled to priority based on U.S. Provisional Application No. 60/281,585, filed May 3, 2000, and hence Zhang ('406) is not effective as prior art against this claim, or against the claims which depend therefrom.

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Claim 46

(Initially, note that the first three sections of this discussion are the same as those above with respect to claim 43).

further comprising using information from said rectified images to form third dimension information associated with each of said two-dimensional points of said image.	The formation of the third dimension for each of the two points is described by finding the disparity value 280 for each pixel u,v, forming the u-v-d volume. This is described on page 4, in the left paragraph.

Therefore, claim 46 is also entitled to priority based on U.S. Provisional Application No. 60/281,585, filed May 3, 2000, and hence Zhang ('406) is not effective as prior art against this claim, or the claims which depend therefrom.

Claim 50

A method, comprising: obtaining two images of similar image information from sources;	Page 2, right column, last full paragraph describes that the input is a pair of stereo images, and page 3 in general, as well as figure 3, shows that these images have similar image information.
superimposing lines formed on said two images to rectify the	The superimposing of lines in two rectified images is

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two images relative to one another to form rectified images; and	described in section 2 on page 3, and illustrated in figure 3 as well as figure 2.
using said rectified images to form three-dimensional information.	The rectified images are used to form the three-dimensional u,v,d volume (see page 4, left paragraph).

Therefore, claim 50 is also entitled to priority based on U.S. Provisional Application No. 60/281,585, filed May 3, 2000, and hence Zhang ('406) is not effective as prior art against this claim, or the claims which depend therefrom.

Claim 55

A method, comprising: obtaining two images of similar image content;	Page 2, right column, as well as figure 3, illustrate obtaining two images of similar image content.
forming a disparity map of three dimensional information for specified coordinates of matching pixels by forming a plurality of areas, finding seed voxels in each of said plurality of areas which have relatively high probability of being correct matches and propagating to other pixels from said seed voxels.	The disparity map formation is described on page 4, left paragraph, and this is described as forming these areas, and finding seed voxels for the areas, see step 1 in the right column of page 4, where the seed voxels have high probability of being correct matches, see second paragraph under step 1, and then tracing from those voxels across two other pixels. See, for example, step 2 entitled "Surface tracing" on page 4.

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Therefore, claim 55 is also entitled to priority based on U.S.

Provisional Application No. 60/281,585, filed May 3, 2000, and

hence Zhang ('406) is not effective as prior art against this

claim, or the claims which depend therefrom.

Claim 60

A method, comprising: obtaining two images of similar image content;	Page 2, right column, as well as figure 3, illustrate obtaining two images of similar image content.
forming a disparity map of three dimensional information for specified coordinates of matching pixels by forming a plurality of areas, finding first information in each of said plurality of areas which have relatively high probability of being correct matches and obtaining said first information at a first resolution, and propagating along a surface to obtain second information at a second resolution less than said first resolution.	Page 4, left column describes obtaining the disparity map and the u,v,d (three-dimensional) images. The seed voxels are described which have a relatively high probability of being correct matches; see second paragraph under step 1.
	Page 6 of the provisional, left paragraph, the last paragraph prior to section 5, describes changing the scale, and hence the resolution of the reconstruction.

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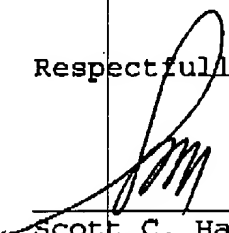Reply to Office Action dated November 26, 2003

Therefore, claim 60 is also entitled to priority based on

U.S. Provisional Application No. 60/281,585, filed May 3, 2000,

and hence Zhang ('406) is not effective as prior art against

this claim, or the claims which depend therefrom.

Therefore, for reasons given in detail above, it has been

established that all claims in the case are entitled to the

filing date of May 3, 2000. This destroys the prima facie

showing of unpatentability made by the rejection, and therefore

a notice of allowance is respectfully requested.

Please apply any other charges or credits to Deposit

Account No. 06-1050.

                                        Respectfully submitted,

Date: 03/24/2004
                                        Scott C. Harris
                                        Reg. No. 32,030

Fish & Richardson P.C.
PTO Customer Number: 20985
12390 El Camino Real
San Diego, CA 92130
Telephone: (858) 678-5070
Facsimile: (858) 678-5099
10379477.doc

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